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GCATC

GRAND CANYON AIR TOUR COUNCIL

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To: U.S. Department of Transportation Docket
Docket No. FAA-993927 -30
400 Seventh Street S. W.
Washington, D.C. 20590

Subject: Federal Aviation Administration Notice of Proposed Rulemaking (NPRM)

Commercial Air Tour Limitation in the Grand Canyon National Park Special Flight Rules Area

From: Robert G. McCune
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Date: September 3, 1999

Comments on the above NPRM are being submitted on behalf of the Grand Canyon Air Tour Council. This Council is an industry coalition of twenty-two Nevada and Arizona air tour operators and associated companies involved with the Grand Canyon air tour industry.

Enclosed with my comments are copies of a pertinent study

"An Analysis of Proposed Flight Restrictions at the Grand Canyon National Park: Estimating the Costs, Benefits, And Industry Impact of the Proposed Regulation"

which was prepared by Center for Business and Economic Research at the University of Nevada Las Vegas at the request of the GCATC. The study was requested by GCATC because of the total air tour industry belief that the economic rationale utilized by the FAA to support this proposed rulemaking was suspect, at least for the major underpinning of the NPRM, and therefore arbitrary and capricious. The study proved this to be the case and a formal request is now made that this NPRM be withdrawn and held in abeyance for such time as needed to create a federal sanctioned commission to review

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both the FAA proposal and the UNLV responsive analysis as to the validity of the economic rationale used in the NPRM and the FAA's Initial Regulatory Evaluation, Initial Regulatory Flexibility Analysis, and International Trade Impact Assessment. Such a federal commission composed of representative park users, local, state, objective federal authorities and acoustics experts could conduct a fair and balanced study to determine if, or to what extent, air tours impact the Grand Canyon and the enjoyment of the park by the majority of park visitors. Then make rational and reasonable recommendations on how to fairly address the problem.

Even though the UNLV analysis was submitted for the record during the FAA's public hearing on the subject NPRM held in Las Vegas on August 19, 1999 it was not submitted in the context of evidencing the need to withdraw and hold in abeyance this NPRM, for the reasons previously stated.

Obviously, until this withdrawal request is reviewed, it behooves those most affected to proceed with other remedial comments to the NPRM that will hopefully be considered prior to any final rulemaking.

1. Limiting commercial air tours in the Grand Canyon National Park Special Flight Rules Area.

- According to GCATC's Counsel the authority to limit flights is not established. This rulemaking represents the first time the FAA has ever attempted to discourage commercial aviation and to limit the use of the Nation's airways. As all of us understand the mission of the FAA, the FAA is charged with the responsibility of promoting and protecting aviation and the safe use of the Nation's airspace. The Proposed Rule is new ground for the FAA. If enacted, the proposed Rule seems vulnerable to challenge in court as beyond the scope of the FAA's statutory authority.

- The GCATC is on record as endorsing the UNLV's Center for Business and Economic Research's economic analysis disagreeing with the FAA's economic rationale used in the NPRM and supporting documents. In fact as stated above and previously, GCATC in endorsing the university economic analysis response to the FAA allocation NPRM, GCATC is unequivocally implying that the credibility of the economic rationale utilized by the FAA in FR Part V, DOT/FAA, Notice of proposed rulemaking, and in FAA's supporting document – Initial Regulatory Evaluation, Initial Regulatory Flexibility Analysis, et al is suspect. Further, in utilizing such questionable supporting data, it argues for the view, that the proposed rulemaking is arbitrary and capricious.

- It is important to carefully underscore that the FAA's proposed economic impact of limiting or a rollback of flights utilizes seriously impaired statements, or lack thereof, in both the Part V, NPRM, and in the Initial Regulatory Evaluation – Initial Regulatory Flexibility Analysis document, dealing with the statutory requirement to evaluate alternative regulatory approaches. In both documents

FAA purports to have met the intent of certain requirements of the Regulatory Flexibility Act as set forth in the Small Business Administration published guide to the RFA. Quote:

> "An initial regulatory flexibility analysis is prepared in order to ensure that the agency has considered all reasonable regulator-v alternatives that would minimize the rule's economic burdens or increase its benefits for the affected small entities, while achieving the objectives of the rule of statute. The analysis describes the objectives of the proposed rule, addresses its direct and indirect effects and explains why the agency chose the regulatory approach described in the proposal over the alternatives. (Underline added.)

The same FAA deficiency exists with the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA) wherein (according to the Small Business Administration's regulatory guide) the FAA is required to deal with these provisions, and again I quote:

> "The following issues are subject to judicial review under the SBREFA:
>
> 0 The final regulatory flexibility analysis including the agency's efforts to evaluate alternative regulatory approaches and reasons for rejecting or accepting them;
>
> • The agency's effort to collect comments from small entities through a variety of mechanisms;" added.)

(Under the SBREFA last issue above; FAA also minimizes their responsibility with this requirement by simply asking small air tour operators in the NPRM to forward the needed data. Hardly much of an effort.)

This same lack of FAA enthusiasm for "alternatives" regulatory requirement was also apparent in their June 3, 1999, briefing to SBA and OMB. Quote:

"ALTERNATIVES CONSIDERED

- Throughout its analysis, the FAA considered several alternatives to the proposed rulemaking.

- Annual operating alternatives considered include a uniform year (no peak/off-peak season) and a shorter three-month peak season (July 1 – September 30). Both were rejected because they could lead to a worsening of the noise problem during the summer season, defined in the 1996 final rule as May 1 through September 30. In neither alternative was the FAA able to estimate the impact on operator net revenue other than it would probably be smaller than this proposed rule. (Underline added.)"

(Please note the last sentence wherein FAA states that they were unable to estimate the impact on operator net revenue in neither alternative. Yet, throughout the Part V NPRM, and in the Initial Regulatory Evaluation – Initial Regulatory Flexibility Analysis document, there are countless examples of other FAA estimating, without the benefit of any solid database. Also in the last part of the last sentence "other than it (operator net revenue) would probably be smaller than this proposed rule," (underline added) is not true. In each "alternative" used – a uniform year (no peak/off-peak season) or a shorter three-month peak season (July 1 – September 30) operator net revenue would be larger, not smaller under the proposed rule with its five month peak season.)

It is the contention of the GCATC that FAA has not complied with the statutory requirements to consider all reasonable regulatory alternatives that would minimize the rule's allocation economic burden. Further, the "alternatives" suggested are not adequately explained as to why the agency chose the current regulatory approach over the alternatives. The reason the FAA probably took this desperate strategy is that there are, in truth, no real or viable alternatives that FAA could list and describe. The FAA simply inserted a brief mention of some procedure options as to how an operator might shift their company's flight allocations over different seasonal scenarios.

No alternatives to the allocation proposed rule – period. Just hypothetical options and then a brief statement that the alleged alternatives were rejected because of the possible movement of increased aircraft noise of Grand Canyon relative to a time option. The rest of the so-called "alternatives" dealt with minor administration issues:

- quarterly reporting
- monitoring allocations

(Note: There was a terse reference to "alternatives" considered by the FAA in dealing with the two year term for the allocations and I quote "In devising the proposed two-year term for the allocations, the FAA considered two other alternatives including revising the allocations annually or on an ad hoc time basis thereafter. The FAA rejected both of these alternatives because it was concerned that neither alternative would achieve the proper balance between providing the certificate holder with the latitude necessary to conduct business, and controlling noise in the GCNP." Apparently, it was never the intent of the FAA to offer these two other alternatives in the context of the Regulatory Flexibility Act requirement to evaluate alternative regulatory approaches. This was the only time they were mentioned before or in the NPRM. Be assured that the NPRM deficiency, and the same for the Initial Regulatory Flexibility Analysis in dealing with the issue of regulatory alternatives is of notable concern to the Grand Canyon air tour industry.

2. **Comprehensive Noise Management Plan**
   It would appear to most people that when undertaking an important plan defined as a "development of a flexible and adaptive approach to noise mitigation and

management" it would have been completed prior to taking any regulatory proposed action as harsh and punitive as the FAA's intent to limit or roll back air tour flights over the Grand Canyon because of alleged noise problem. Especially when the FAA NPRM contends that this plan "will, at a minimum do the following 1.) address development of a reliable aircraft operations and noise database." Again, most people, especially those about to be severely restricted in their small business operation, would realistically want to ask these questions "Without this information, (noise database) how do you know there is a problem?" and "Why are you trying to fix a problem that may not exist with such Draconian measures?" Therefore, it is again suggested that until there are factual reasons for this NPRM, it should be withdrawn, or at least held in abeyance, until such time as the FAA has in hand the information and database on which to evidence a problem, and then the solution.

3. **Specific Matters For Comment**

FAA has requested specific comments to six questions on page 373 11 Federal Register, Part V, under the above title. Further, "that after a review of such comments, it is indicated that the final rule may incorporate changes based on these comments." This will be a "first" in all the four years of NPRM comments the air tour industry has filed, if even, one change is made in this final rule as a result of comments received. Regardless, we submit for your hopeful consideration the following responses to the six questions:

1.) No FAA predicted peak season for the purposes of assigning allocations. The only accurate predictor of peak or non-peak periods will continue to be the marketplace.

2.) The air tour operators are evenly divided between Universal Coordinated Time or Mountain Standard Time.

3.) No reporting should be imposed as a condition of a Form 7711.

4.) It is felt that 180 days is too arbitrary and should be a longer time period in such a serious use or lose provision, as proposed in section 93-321.

5.) All air tour operators unanimously feel that each initial allocation is 35% to 45% on the low side in reflecting business operations as of July 9, 1999.

6.) There are unanimous views that the allocation is the wrong process in dealing with the FAA/NPS overflight concerns. Once you start with a serious flawed procedure to resolve an alleged problem, the chances for success are slim or none that it will work. Therefore, the FAA should build in flexibility in their overall proposal and planned use of a specific period of time. Especially when the specific period of time

is predicated on completion of a comprehensive noise management plan.

4. International Trade Impact Assessment

This subject in the FAA's NPRM is probably the most lacking in terms of required regulatory review. The dismissal of this assessment with the quote "The FAA has determined that the rulemaking would not affect . . . . . nor affect U.S. trade," (underline added,) is perhaps one of the most offensive examples of FAA's unwillingness to provide due diligence to this most important matter to the United States and the Grand Canyon air tour operators.

The FAA simply acknowledges that due to the high percentage of foreign patronage of Grand Canyon air tour services, foreign trade may be affected by disruption of marketing of the tours. A survey of Southern Nevada based air tour passengers done by the Center for Business and Economic Research at UNLV indicates that in recent years, over 90% of clients are international visitors.

Though this is a possible source of declining demand, the more likely foreign trade impact is the loss of service exports of flights that would be demanded but cannot be sold due to the regulation. This is not considered at all in the report. It is most important that FAA reflect favorably on the economic contributions of air tours in terms of international trade benefits.

. AN ESTIMATED 90% OF GRAND CANYON AIR TOURS FROM SOUTHERN NEVADA ARE SOLD TO INTERNATIONAL VISITORS

. AIR TOURS ARE "SERVICE EXPORTS"

. THE PROPOSED FAA RULEMAKING WILL HAVE A NEGATIVE EFFECT **ON** THE U.S. BALANCE OF TRADE

5. Quiet Technology for Aircraft

This subject is "another orphan" that suffers from FAA's lack of due diligence. An option that has "a potential problem solving strategy" written all over its realistic possibilities. Yet because this matter is only slightly addressed in the NPRM, there is no basis to respond. Going back to 1997 the FAA published a Notice of Availability of Proposed Routes and a companion NPRM (Notice No. 97-6) that proposed two noise efficient/quiet technology incentive corridors. This proposal was withdrawn in July, 1998, along with a proposal for a route through the central portion of Grand Canyon National Park. This was a sad development, more so, when FAA advised that "Due to resource constraints, the FAA has not been able to prepare a disposition of comments received in response to Notice 97-6." Another example of where the air tour's many offers for negotiated rulemaking would have been useful to all parties, as well as educate FAA on how quiet technology is already being utilized. Apparently this "resource constraints" is still the case, as this current notice (99-12) is also still lacking specifics other than references to future planning for hopeful and eventual

outcomes. There must be solid plans to put on the books, provisions or incentives for air tour carriers to continue to operate quiet aircraft and increase the technology.

Perhaps a few succinct thoughts might encourage the FAA to find resources that will help them to listen to the message concerning quiet technology.

The FAA should focus on concrete proposals and practical incentives for quiet technology aircraft rather than unnecessarily eliminating noise for its own sake. Government needs to set quiet technology standards, goals and time frames for aircraft manufacturers. Quiet technology aircraft standards have been "on the drawing board" of NPS and FAA since December 1996, but have yet to be proposed. Fear of being driven out of business will discourage operators from investing in quiet aircraft.

Inability to fully utilize new aircraft (e.g., caps/curfews) discourages investment in quiet technology aircraft due to inability to amortize the investment effectively. Government needs to set example by phasing in quiet technology aircraft for its own operations in national parks.

The proposed rules attempt to "divide and conquer" the air tour industry rather than achieve fair, attainable standards for maintaining quiet parts of GCNP.

The GCATC will submit comments on the FAA prepared draft environmental assessment in their response to the Federal Register, Part IV NPRM, dealing with "Modification of the Dimensions of the GCNP-SFRA and Flight Free Zones.

In closing the GCATC would like to emphasize again, their view, that this NPRM be withdrawn and held in abeyance, until such time that a federal sanctioned commission be established to review both the FAA proposal and UNLV responsive analysis, as to the validity of the economic rationale and findings used in the FAA's allocation NPRM and the FAA's Initial Regulatory Evaluation, Initial Regulatory Flexibility and International Trade Impact Assessment.

We believe we have made a reasonable point that the allocation or rationing of air tour flights in the SFAR 50-2 is rulemaking at its worse – arbitrary, capricious, as well as punitive – to an industry that has done nothing wrong.

Should the FAA deny our request to withdraw the allocation proposed rule, then we feel necessarily obligated to offer possible and fair minimal impact changes for FAA's consideration in their questionable NPRM as they consider docket comments.

1. Increase the base period for the allocation average from May 1, 1997, to April 30, 1998 (12 months) to May 1, 1997 to April 30, 1999, (24 months.) This would mitigate somewhat the FAA's use of the worst historical flight year ever, due to the economic recession in the Asian rim countries and forty-five (45) days of weather no flight days as the allocation benchmark year.

2. Eliminate the curfews of 6:00 P.M. to 8:00 A.M. during summer and 5:00P.M. to 9:00 A.M. during winter as flight free time periods throughout the year as set forth in the proposed regulation for Dragon and Zuni Point Corridors.

   The FAA has or will place such severe restrictions on the annual percentage of flights that can be flown during the peak season that the curfew is as unnecessary, as the cap on aircraft was discerned to be, and is now being eliminated. Sunrise air touring during winter months is critical. At least move the morning time to 7:00 A.M.

3. Delay the effective date of a final regulation in order to provide a March-April available time period that would facilitate proper training (airspace conditions, flight free zone modifications, route change, departure and arrival traffic congestion points and improved upgrade "see-and-avoid" capability that will be necessary for safety reasons due to the proposed NPRM.)

4. In the name of equity, we ask that the following comment contained in the NPRM, entitled "The Proposal" and Part H, thereof, entitled "H. Transfer and Termination of Allocation" be deleted. Quote:

   "The FAA also would retain the right to redistribute, reduce or revoke allocations based on the need to carry out its statutory mandate to regulate for efficiency of airspace or aviation safety." This is probably the best NPRM indication of how FAA perceives its arbitrary and punitive role in the future.

END OF COMMENTS

Enclosure

The Center for Business and Economic Research
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An Analysis of Proposed Flight Restrictions at the Grand Canyon National Park: Estimating the Costs, Benefits, and Industry Impact of the Proposed Regulation

Prepared by

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August 18, 1999

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Executive Summary

This study assesses the draft regulatory evaluation presented in the FAA's Initial Regulatory Evaluation and Regulatory Flexibility Analysis (RFA) of the Notice of Proposed Rulemaking for commercial air tour limitation in the Grand Canyon National Park special flight rules area. Special attention is paid to the cost-benefit analysis contained in the RFA, long-run economic impacts resulting from the proposed ruling, and the credibility of the analysis and methods contained in the report.

We find that the cost-benefit analysis is lacking in methodological rigor, the data used and the scope of the analysis. With respect to net benefits of the proposed regulation, the most glaring omission from the report is the failure to account for losses in benefits to air tour customers due to suggested fare increases resulting from restrictions on the number of flights. Also, a combination of suspect studies and conjecture is used to estimate the economic damages incurred by ground visitors to the Grand Canyon. Under different and equally reasonable sets of assumptions, the estimated 1 O-year benefits of the noise-reduction program are reduced by half to less than $17 million. The cost estimates also suffer from equally unfounded assumptions. Demand projections of the air tour industry, perhaps the most critical aspect of costs, are based on data that encompass all tower operations from the five airports that serve-air tour operators, including commercial point to point flights and general aviation.

There are also problems with the base year chosen for the allocations, May 1997 to April 1998. The year is not representative of the long-run industry demand due to the large drop in Asian tourism during that time. In addition, weather conditions during the base-year precluded air operations for 45 days. These were the worst weather conditions

in the history of Grand Canyon air tour operations. Evidence suggests that demand during that period was between 15 and 22% below long-run expected demand. Limiting flights to those flown in an unusually poor year puts all operators at risk of not being able to meet their capital obligations. There is the potential for many firms to fail, leaving the market to only a few firms. This possibility is not considered in any detail in the report. Costs of altering the fleet to a more competitive mix under the regulations are also not considered. All in all, the base year assumption and the failure to consider important economic impacts places the industry on a permanent recession footing.

Another problem with the proposed regulations is that they alter the long-run investment decisions of the air tour companies in a manner that is inconsistent with reducing noise levels in the Canyon. Since the allocations are not protected as a property right, the proposed rules induce a high degree of uncertainty into the future of the industry, which in turn distorts investment decisions of the firm operators concerning long-term investments, thereby raising capital costs. In particular, because the proposal does not include any incentive for acquiring quiet technology aircraft, higher capital costs associated with the uncertainty have the adverse impact of deterring investment in quiet aircraft.

Finally, the proposed regulations don't consider any truly different alternatives to flight quotas. Quotas are inherently inefficient in the long run when attempting to control environmental problems. Incentive-based strategies are preferred to quota systems because they almost always offer *the same* level *of benefits at a reduced cost.* Under incentive systems for managing environmental problems, industries have a constant incentive to reduce the amount of noise through technological changes and innovations in

an effort to capture the cost savings from reducing noise. Regulatory strategies based on incentives rather than quotas must be included in any final analysis.

I. *Overview of the proposed regulations*

The proposed rulemaking is a response to statutory mandate following from Public Law 100-91 requiring "substantial restoration of natural quiet to the Grand Canyon". The purpose of regulations is to restore natural quiet to the Grand Canyon National Park (GCNP). Natural quiet is defined as 50% of the Park experiencing no audible aircraft for 75-100% of the day. The focal point of the proposed regulations is a limitation on, and subsequent allocation of, commercial air tours to the Grand Canyon and establishment of new sightseeing flight paths. Specifically, the regulation modifies the dimensions of the GCNP Special Flight Rules Area by establishing new and modified flight free zones, adding curfews in some flight corridors, and raising minimum altitudes. Further noise reduction is achieved by limiting the number of sightseeing flights to the GCNP to 88,000 by proportionate allocation of reported flights to air tour companies operating during the base-year of May 1997 to April 1998.

Under the proposed regulation, flights will be allocated to companies based on their number of flights in the base year. Four types of allocations exist:

a. Peak season Dragon/Zuni flights

b. Peak season other area flights

c. Off-peak Dragon/Zuni flights

d. Off peak other area flights

Companies will receive one allocation for each flight they reported during the base year. Allocations will be adjusted for mergers and acquisitions occurring between the base year

and the present. For example, if Company 1 flew 172 type a. flights during the base year, they will receive 172 allocations for that type each year for the next two years. Allocations are not a property right, and cannot be permanently transferred without the approval of the FAA. However, allocations may be transferred between companies (but not between types) on a temporary basis.

Federal laws mandate that when a significant number of small entities is impacted that the agency (the FAA in this case) must prepare a regulatory flexibility analysis (RFA). The law requires agencies to evaluate flexible regulatory proposals and explain the rational for their proposals. Prior to the Notice of Proposed Rulemaking (NPRM), an RFA was prepared to investigate regulatory alternatives to restore natural quiet in the Grand Canyon. It is to these two documents, the NPRM and the RFA, that the following discussion refers.

II. Calculation of Benefits

Reported benefits of the proposed regulation accrue only to ground GCNP visitors. Benefits to individual park users are estimated using a standard economic measure termed "consumer surplus" defined as the difference between what a person is willing to pay for a good and what they actually pay for the good (Zerbe & Dively, 1994). Total benefits are calculated using what the report terms "the benefit transfer approach", whereby data from similar sites are used to estimate consumer surplus in lieu of collecting site-specific data. Benefits are estimated for three groups: river-users, backpackers, and others, including sightseers, hikers, and campers. Visitor days for each

group during 1997 are 99,137, 182,48 1 and 5,788,187, respectively, giving total visitation during that year of 6,069,805.

Calculation of the total economic benefit of the regulation, in terms of consumer surplus, proceeds in several steps.

1) Using three different external willingness to pay studies, visitor day values are multiplied by total visitation in each category and total annual willingness to pay for recreation in the Park, without the regulation, is calculated.

2) Using an external study that provides qualitative information concerning recreationists' exposure to aircraft noise in the Park, varying levels of benefit reduction are applied to each category of visitor depending on their exposure to aircraft noise. Due to the lack of information concerning actual reductions in willingness to pay for recreation in the Park, benefit reduction is chosen arbitrarily as follows: 20% for those slightly impacted, 40% for those moderately impacted, 60% for those impacted very much, and 80% for those extremely impacted. A sensitivity analysis is reported that uses ½ of the benefit-reduction levels. The estimated total lost consumer surplus from aircraft noise for 1997 using the full-benefit reduction is $34'453,000.

3) Next, a linearized noise measure is calculated for the base year. Expected noise measures are calculated given that no action is taken to limit aircraft in the Canyon. For a given year, the percentage change between noise levels in the base year is applied to the lost consumer surplus. For example, the base-year linearized noise measure is estimated to be 12 19.23 and 1577.47 in 2000. This is a change of 22.71% in noise levels, so undiscounted costs are reduced by 34,453,000*.2271=$7.82

million, meaning that benefits attributable to the regulation in that year are $7.82 million.

Criticisms of the methodology.

The estimation of the benefits of the proposed restriction on commercial air tours in the Grand Canyon has a considerable number of methodological flaws. These flaws include the choice of valuation technique for the nonmarket benefits, unfounded assumptions concerning economic damages, and failure to account for benefits of an entire consumer group - the air tour consumers. Due to the nature of nonmarket valuation, the results are highly sensitive to the data and assumptions used, making methodological rigor of the utmost importance. Below, we discuss each error or omission in detail, and where appropriate, recalculate benefits based on alternative assumptions to that made in the analysis in question.

Choice of valuation technique and study selection criteria

The "benefits transfer method" of valuing a nonmarket good - such as recreation in a national park - is subject to large amounts of error as a result of deviation of the good in question from those used in the related studies, compounding of error from the original studies, and differences in the data available from the related study and that needed for the research at hand. Due to its inaccuracy, the benefits transfer method is not mentioned as a reliable valuation method in standard environmental economics texts such as Freeman (1993). If the criteria listed on page 43 of the RFA are indeed met, then the results serve only as a rough estimate of the site-specific recreational value and should not be taken as being consistent with the industry standard for nonmarket valuation.

Four valuation techniques are currently recognized as "state of the art" for estimating the economic value of nonmarket goods (Freeman, 1993). These are contingent valuation, hedonic studies, travel cost studies, and meta-analysis. Of these four, meta-analysis most closely approximates the benefits transfer method. With meta-analysis, the value of a nonmarket good is estimated using a set of past studies that value similar goods. A set of studies is used because the estimate, essentially an average of the values contained in the previous studies, is more precise than if only one study is used. Generally speaking, the precision increases as more studies are used.

Ironically, the meta-analysis approach has come under heavy fire from both economists and statisticians with critics claiming that the results are subject to large amounts of error due to small sample sizes. The benefits transfer method then, can be seen as the worst case of a highly suspect methodology.

The criteria outlined on pg. 43 of the RFA provide a basis for the selection of studies that should be included in a meta-analysis. Unfortunately, the study selection criterion, "selected economic studies must use appropriate valuation methodologies" is not adequately met for the HBRS, Inc and Harris, Miller, Miller, & Hanson, Inc. (1993) study (pg. 43 RFA). The study reports the percentage of visitors by category that are impacted either "not at all", "slightly", "moderately", "very much", or "extremely". Ordinal categorizations such as this are absolutely useless for valuing the impact of the noise. A simple example illustrates this point. One person may respond that they were only slightly affected by the noise, but if questioned further, may be willing to pay $20 for the experience without noise. Another individual may be disturbed "extremely" by the noise, but only willing to pay $5 for relief. Therefore, the data neither economic damages from overflights or can any economic benefits of noise reduction be deduced from it. The

estimated damages are entirely determined by the values chosen by the report authors for the benefit reductions assigned to each of the impact categories.

In essence, the report uses a poorly designed study (HBRS) in a suspect methodology (benefits transfer) and formulates conclusions that are not based on standard methods. The results concerning baseline losses in consumer surplus from aircraft noise, therefore, are untenable and cannot stand the test of scientific assessment. To illustrate this shortcoming, let'sassume that the visitor-day value for those affected slightly is reduced by 1%, those affected moderately by 3%, those affected very much by 8%, and those affected extremely by 10%. Then the reduction in consumer surplus attributable to aircraft noise in 1997 is reduced by almost ten times from $34.6 million to $3.6 million. It is important to note here that no empirical evidence exists allowing us to choose between these two estimates of $34.6 million and $3.6 million. In short, pure conjecture unsupported by any theory or evidence provides no basis for reputable rulemaking.

Assumptions concerning economic damages from noise

Further problems exist in the study concerning the benefits to Grand Canyon visitors from reducing aircraft noise. The calculations assume that the percentage reductions in noise result in a one to one percentage increases in benefits to the affected parties. Empirically, there is no reason to believe this, and indeed, economic theory posits the concept of diminishing marginal benefit, that is, additional units of a good provide less and less satisfaction for the individual. Typically, environmental damages are very low or zero at low levels of an externality due to the environment's assimilative capacity. As the level of damage, noise in this case, increases, economic costs increase to reflect higher damages from each additional decibel. In the framework of willingness to

pay, the concept of increasing marginal cost of noise (or diminishing marginal benefit of quiet) means reducing the first unit of noise will have the greatest benefit to the individual, and the added benefit from each consecutive unit of noise will be smaller.

As before, we change the assumptions of the model and recalculate the benefits assuming that the first 6% of noise reduction increases benefits by 10%, the next 6.4% of noise reduction increases benefits by 8%, the next 6.8% of noise reduction is paired with a benefit increase of 5%, and the final 7% of noise reduction increases benefits by 1%. Using these assumptions, year 2000 benefits fall from $7.82 million in the FAA model to $3.7 million in our model. Again, we find large variations in program benefits resulting from changes in model assumptions. Accurate estimation of the consumer surplus of each activity and the noise damage function is needed in lieu of arbitrary assumptions about these critical parameters outlined in the report.

Benefit losses to air tour consumers

Probably the most glaring omission from the report is the failure to account for consumer surplus losses due to fare increases resulting from restrictions on the number of flights. The report concedes that as demand for flights increases, the airlines will be able to raise prices to recoup the lost revenues associated with more flights. If this is true, then for each dollar increase in the flight, each passenger loses a dollar in consumer surplus.

In a properly conducted cost- benefit analysis, this loss in consumer surplus should be subtracted from the consumer surplus for air tour passengers estimated for those visiting the Grand Canyon on the ground. There is no methodological reason for excluding the air passengers from the analysis, in fact, standard industry analysis of the

impacts from regulation include estimation of the increase in costs to a firm and the lost consumer surplus to consumers in the industry.

Many substitutes exist for Grand Canyon flights. These substitutes include flights to other sightseeing destinations, travel by bus or car to the Canyon, or visiting another site altogether, then consistent with economic theory, we expect elasticity of demand to be higher than for leisure travel in general. Estimates of the elasticity of demand for leisure travel indicate that the value is approximately 2 (Shaw, 1988). Using a constant elasticity of demand estimate of 2 and an illustrative flight cost of $100, estimated losses in consumer surplus exceed $18.4 million for the ten years investigated in the report if the industry would have grown at 3.3% per year absent the regulation.

The report may also be criticized in how it presents other studies to support its findings. For example, though not offering any specific values, the report alludes to nonuse benefits that may accrue to the general public from Grand Canyon quiet. Specifically, the report refers to a study done for the Bureau of Reclamation concerning the non-use value of changes in flow levels in the Grand Canyon and makes the claim that the study provides evidence of "potentially significant non-use benefits from noise reduction in the Grand Canyon". One of the primary motivations of changing flow levels in the Canyon was to aid several species of native endangered fish. Endangered species derive their economic value from their contribution to biodiversity and are typically associated with high non-use values. Therefore, the high non-use value of changing dam operations is most likely associated with the endangered species that would be affected, and not any inherent value of returning the Grand Canyon to a "natural state".

Another example of misrepresentation is the report's claim that a discount rate of 3% is supported by economic theory. In fact, their chosen rate for discounting consumer

surplus is not supported by economic justification. Though Freeman (1993) is cited, Freeman's actual discussion concerning choice of discount rates states that discount rates should reflect the opportunity costs of funds. However, numerous factors such as taxes, inflation, and some aggregation of the individual's rate of time preference, preclude a definitive answer on the choice of the discount rate. Choosing a rate that reflects the actual cost of borrowing for consumers is one practical solution. The chosen rate of 3 % is not a function of-these variables and instead, seems to be chosen arbitrarily.

III. Calculation of Costs

Typically, calculating the costs of a regulation involves estimating the difference in net operating revenue with and without the regulation. The report does this in a detailed fashion, using variable costs by aircraft published in Economic Values for Evaluation of Federal Aviation Administration Investment and Regulatory Programs, including fuel, oil, maintenance, and labor as variable operating costs. Future industry demand is estimated using tower operations for the five airports associated with Grand Canyon air tours and published fares are used to estimate prices over the ten years under study. The number of passengers under the proposed regulation assumes planes will fly at full capacity, given adjustments for seasonal load factors.

Criticisms of methodology.

Examination of the cost analysis and the underlying assumptions reveals several potential problems with the assumptions, analysis, and findings. These include assumptions concerning firm revenues, growth rates, the choice of the base year as an

accurate assessment of current industry equilibrium, and the impact on the firms of increased capital and-transaction costs. Each of these points is discussed in turn.

Calculating baseline prices

When calculating baseline prices for estimating baseline revenues, "published prices" were used. However, as conceded in the report, the bulk of the passengers are booked either through the casinos or through tour agencies, and bulk discounts often apply, implying total industry revenues may be lower than those reported in the document.

Another potential problem with the tour prices used in the report is that they reflect current unregulated routes. Proposed changes in the flight paths requiring higher minimum altitudes and limited viewing of certain areas of the Canyon could impact customers' willingness to pay for flights if the length of viewing time or aesthetic experience is diminished. This possibility, and any probable adjustment in prices, is not included in the analysis.

Forecasting industry growth rates

A shortcoming in the cost analysis involves the estimation of air tour industry growth rates. The industry growth rates (absent the regulation) assumed in the report appear to be based on operations of all commercial and general aviation flights using the five airports used by Grand Canyon air tour operators. There is no reason to believe that the air tour industry will grow at the same rate as other air travel at the airports. In fact, general aviation and business-travel would be expected to grow with total employment and population, while leisure-travel growth is most likely to follow growth in hotels, casinos, and other attractions. Moreover, the most critical component of demand for the air tour market is foreign travel. The recent Asian crisis resulted in significantly different growth rates between commercial point to point, general aviation, and the Grand Canyon

operators. Therefore, use of aggregate growth rates is likely to bias estimates of growth in the air tour industry alone. The direction-of bias may not be determined without statistical and economic modeling directed at the commercial air tour industry instead of the transportation airline and general aviation industries.

Choice of base year

Perhaps the most problematic assumption in the analysis is that the base year chosen is an accurate picture of air tour industry demand. In fact, the year is not representative of long-run industry equilibrium either presently or historically. The collapse of several Asian currencies in the third quarter of 1997 had an enormous impact on Asian visitation to Las Vegas and other American cities, with Asian tourism into Las Vegas declining by 24.3 percent according to the Las Vegas Convention and Visitors Authority.

A survey of Southern Nevada-based air tour passengers done by the Center for Business and Economic Research at UNLV indicates that in recent years, over 90% of clients for the Southern Nevada based operators are international visitors. See Table 1. According to the *RFA,* Asian visitors have historically accounted for 60 to 90% of the demand for air tours to the Canyon. If 60 to 90% of the customer base is reduced by 24.3%, then this can translate into a demand shock of 15 to 22%. See Table 2. The consensus among economists is that the economic impact of the Asian Crisis, while temporarily undermining Asian service exports such as commercial air tours, is a temporary phenomenon and not a long-run feature of international trade. Given the financial assistance granted by the International Monetary Fund to Korea and Japan's current stimulus package, the Asian economies are expected to resume economic growth this year, implying a return to more favorable conditions.

Table 1. Flights, passengers, and origin of passengers
from a survey of Southern Nevada Grand Canyon air tour operators

	1995	1996
Number of flights	37,649	60,029
Number of passengers	369,205	436,925
American	30,831	35,051
Foreign	338,374	401,874
Percent American	8.4	8.0
Percent foreign	91.6	92.0

Table 2. Asian visitation to Las Vegas, 1997 and 1998
Source: Las Vegas-Visitors Convention Authority

	1997	1998	% change
Japan	403,000	342,000	-15.1
S. Korea	122,000	61,000	-50.0
Singapore	26,000	14,000	-46.2
Taiwan	79,000	60,000	-24.1
Total	630,000	477,000	-24.3

It is important to note that the rapid devaluation of Asian currencies was a completely unexpected event, both from the position of international currency traders and air tour industry forecasters. As such, the subsequent fall in demand for Grand Canyon air tours was also unexpected and unforecastable. Since capital investment decisions are based on expected demand, using a historically low year for allocations endangers the operator's ability to cover capital costs. The regulations would force firms to produce at a level well below their capacity. Failure to cover long-run capital and other fixed costs will eventually lead to firm closure and increased industry concentration.

Capital and transaction costs

Air tour operators chose airplanes by weighing the operational costs of the aircraft, seating capacity, and viewing experience. Larger aircraft may have lower average operating costs, but don't provide the same viewing experience as smaller aircraft. Since airplanes have a 20-year usable life, the number of aircraft purchased by

the firm is a long-run decision that is based on long-run demand for air tours. Flight restrictions, especially those based on deviations from long-run demand, will alter the size and number of aircraft that enable firms to be efficient, forcing firms to alter their fleet in an attempt to remain competitive. These costs are not included in the report.

Changing their fleet will incur two costs to the firms that are not included in the report. Transaction costs, those costs incurred by selling old aircraft or purchasing new ones, will be substantial for firms that have fleets of smaller aircraft. Net capital costs, the per passenger difference between the cost of the old airplane and its replacement, will also be high for those firms that must alter their fleet to remain competitive. Neither of these costs is included in the report.

IV. General Criticisms of the regulation from an efficiency perspective

The preceding sections have focused on the failures of the cost-benefit analysis contained in the RFA. Though benefit-cost analysis, when done correctly, may successfully assist policymakers in ranking alternatives, it provides little insight into the relative efficiency of alternatives that are not discussed. Further, long-run economic impacts are generally not accounted for in a cost-benefit analysis. The following paragraphs discuss the long-run economic implications of the proposed rulemaking, and the shortcomings of the FAA analysis with respect to long-run substitution effects among ground and air visitors to the Canyon.

Firm exit, industry concentration, and consumer welfare

The report does not analyze air tour industry impacts in terms of firm failure and downsizing in any meaningful fashion. To be sure, the report admits that since some operators were operating at a loss during the base year, that these firms and others may be put out of business. Given the meager amount of data used in the analysis, however, one

cannot test the hypothesis of profitability or viability. A clear picture of the industry after two years of regulation is conspicuously absent from the report.

As operating costs rise from new reporting requirements and increased fuel and labor costs associated with new flight paths, it is highly probable that some firms will not be able to cover overhead costs and will be forced to exit the industry. This will have two negative social impacts. First, the industry will become more concentrated, inducing losses in consumer-&u-plus as prices rise. Second, firm closures will result in unemployment of ground and flight crews for the affected firms.

Though short-run production decisions are correctly based on short-run profits (total revenue less total variable cost), the decision of whether to continue to produce or exit the industry is based on long-run economic profits (expected future revenues net of total operating and fixed costs). The regulatory cost analysis focused on the variable costs, due to the availability of data. To understand the long-run impacts to the industry as a whole, such as industry concentration, firm revenues, and economic profit, one must look to fixed costs. As one might expect, the fixed costs borne by air tour operators are substantial. According to Schwer et al. (1999), fixed costs, including insurance, aircraft, facilities rental, and other leases are 19% of the total air tour industry expenditures for Southern Nevada.

The report acknowledges that of the six operators for which they have profit data, two suffered financial losses during the base year. However, the report fails to discuss this topic in a quantitative fashion. If firms are restricted to output levels that caused them to suffer losses, their future viability is in doubt. It may be unreasonable to extrapolate from the sample and suggest that 1/3 of the firms will go out of business due

to the proposed rule, especially since there is a strong indication that the mandates will cause firm failures.

Though the report recognizes that firms will fail as a result of the regulation, they don't allow for the possibility that the eventual outcome may be only a handful of firms supplying the entire market. In the extreme, the regulation could create a monopoly, or eradicate the industry altogether.

These adverse possibilities are given short thrift in the report. Market concentration is associated with higher prices and restricted output if firms gain market power through increased market share. Though higher prices and restricted output may seem to naturally benefit those seeking quiet, they result in another round of losses to consumers of air tours, and the net benefit may be negative. Firm downsizing means unemployment for redundant employees. If all firms fail, the collapse of the industry will mean large losses in consumer welfare, as well as unemployment and associated social problems.

In summary, the final result cannot be determined without further investigation into the elasticity of demand for commercial air tours and a reasonable forecast of industry size in the future, given that some firms leave the industry. The study is clearly incomplete concerning this very important issue.

Adverse impacts from noise regulation

Another problem with the proposed regulations is that they alter the long-run investment decisions of the air tour companies in a manner that is inconsistent with reducing noise levels in the Canyon. Since the allocations are not protected as a property right, the proposed rules induce a high degree of uncertainty into the future of the industry, which in turn distorts investment decisions of the firm operators concerning

capital and other long-term investments and raises capital costs. In particular, because the proposal does not include any incentive for acquiring quiet technology aircraft, higher capital costs associated with the uncertainty have the adverse impact of deterring investment in quiet aircraft. Quiet aircraft could provide a permanent solution to the noise externality while still allowing the air tour industry to grow at a modest pace.

Substitution effects, environmental degradation, and social efficiency

A major shortcoming of the study is its failure to account for substitution effects between those tourists visiting the Canyon by air and those tourists visiting using ground transportation. Clearly, some of those deterred by rising prices for air tours will opt to visit the Canyon by ground. According to a survey of air tour passengers for tours originating in Southern Nevada done by the Center for Business and Economic Research at UNLV, 27% of air tour consumers stated that they would still consider visiting the Grand Canyon if air tours where eliminated. Using the 3.3% expected growth in the air tour industry projected in the *RFA*, the regulations will turn away 230,146 air visitors between 2000 and 2010, resulting in increased demand for ground visitation of 62,139.

Ground visitors impact air quality, strain camping, service and waste disposal resources in the Park, and contribute to the already congested environment. These impacts should be considered in the rulemaking.

Foreign trade impacts of the proposed repulation

The report acknowledges that due to the high percentage of foreign patronage of Grand Canyon air tour services, foreign trade may be affected by disruption of marketing of the tours. A survey of Southern Nevada based air tour passengers done by the Center for Business and Economic Research at UNLV indicates that in recent years, over 90% of clients are international visitors. See Table 1.

Though this is a possible source of declining demand, the more likely foreign trade impact is the loss in service exports of flights that would be demanded but cannot be sold due to the regulation. This is not considered at all in the report.

V. *Alternatives to the proposed regulation*

The Regulatory Flexibility Act and the Small Business Act require regulators to consider alternatives to the proposed regulation when a significant number of small entities are affected-by the regulation. The proposed regulation is in essence, a quota on the number of flights that may be flown to the Grand Canyon. The two alternatives listed, allowing for a three month peak season or allowing for permits to be used any time of the year, though offering some variation in policy, are not the most economically based alternatives to the regulation. An entire class of alternatives – incentive based systems for moving to quite technology aircraft – has been completely ignored in the document. This is a distressing oversight.

For example, the report does not consider in any detail economically more efficient alternatives to the proposed quota system providing subsidies to the air tour operators to encourage a switch to noise efficient aircraft. A subsidy would provide incentives to replace older, noisier aircraft with more noise efficient aircraft while reducing losses to consumer surplus for both air and ground visitors to the Canyon in the long-run. The thinking is to allow air tour operators the latitude to deter-r-nine the least cost method to reduce noise, instead of having a central authority, unfamiliar with their industry, make that determination.

Amongst economists, incentive-based strategies are preferred to quota systems like the one proposed for the GCNP because incentive-based strategies almost always offer *the same level of benefits at a reduced cost* (Field, 1997). This is because quota

systems are an all or nothing proposition – overflights and noise are reduced one time, and benefits stagnate. Under incentive systems for managing environmental problems, industries have a constant incentive to reduce the amount of noise through technological changes and innovations in an effort to capture the cost savings from reducing noise. Therefore, benefits of the program will increase over time, as the marginal costs of the program eventually decrease.

The failure to investigate the benefits and costs of an incentive-based program for reducing aircraft in the Grand Canyon is a major flaw in the proposed rulemaking. Given that the same benefits could be achieved at a lower cost to producers, the omission restricts policymakers to consideration of a few very similar and inefficient methods for reducing aircraft in the Grand Canyon is a major flaw in the proposed rulemaking. Given that the same benefits could be achieved at a lower cost to producers, the omission restricts policymakers to consideration of a few very similar and inefficient methods for addressing the issue.

VI. *Suggestions for re-evaluation of the costs and benefits*

The final results concerning the level of benefit from the program are highly sensitive to the methodology used, and as such, the benefits attributed to the program are highly suspect. Though many noneconomists are unfamiliar with the standard methods for nonmarket valuation, a consensus has been reached in the economic research community concerning the appropriate techniques for nonmarket valuation. These procedures were almost entirely disregarded in the analysis. The final results concerning the level of benefit from the program are highly sensitive to the methodology used, and as such, the benefits attributed to the program are highly suspect. Given the very large economic impact suffered by the air tour operators conceded by the report, a rigorous and

scientifically based assessment of the economic benefits of the program should be performed to justify such large industry impacts. Therefore, we suggest a more appropriate approach to estimating economic benefits and costs that relies primarily on site-specific data and direct observation by people actually affected by the noise.

For assessing the economic benefit to people on the ground of the proposed regulation, the appropriate estimation technique is contingent valuation. Another method, the travel cost method, deduces an individual's willingness to pay for a visit to a site from the costs of their travel to the site, is inappropriate in this situation because visitors to the Canyon often visit other sites as part of their total trip. When this is the case, it is misleading to attribute the entire expense of the trip as willingness to pay for only one site.

In contingent valuation, visitors to the Canyon are questioned, either in person, my mail, or over the telephone, concerning the impact of aircraft noise on their visit. Specifically, various hypothetical scenarios are posed to each respondent involving varying levels of aircraft noise and their willingness to pay for a Grand Canyon trip, given that level of noise. Survey respondents are also questioned about their activities in the Canyon and other visitor-specific characteristics such as income that may affect their demand for Grand Canyon trips. Using the information obtained from the survey, a demand curve may be estimated and the loss in consumer welfare may be calculated.

Estimation of the costs of the proposed regulation must also be addressed before the study has any credibility. A demand curve may be estimated using industry data over time obtained from the air tour operators and consumer and producer surplus losses can be derived from that. However, given the variability of the demand for Grand Canyon air tours, caution must be taken when projecting demand for flights over the next ten years.

A credible forecast model will use industry-specific data in conjunction with'national forecasts of international trade with respect to Asian countries, as well as growth in the Las Vegas hotel sector. Given a reasonable projection of growth in demand for Grand Canyon air tours, estimation of the consumer surplus loss to the consumers proceeds in a relatively straightforward fashion.

VII. Conclusion

The RFA contains serious methodological flaws that cast doubt on the results concerning the benefits and costs of the regulation. Suspect modeling techniques are used to calculate benefits to GCNP visitors. The lost benefits to an entire consumer group, Grand Canyon air tour customers, are not included in the analysis. With respect to costs, industry growth rates are based on inappropriate data, and almost certainly understate the long run growth rate. Also, the cost of altering the air tour fleet mix necessitated by the new regulation is not included.

The base-year chosen for the allocation was 15 to 22% below long-run expected demand for the industry. Therefore, the allocations force the operators into a period of permanent recession, which will lead to the closing of several firms, losses to consumers, and unemployment in the industry. Industry concentration is also a likely result.

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